Grundprobleme der großen Philosophen. Philosophie der Neuzeit VI. Tarski, Reichenbach, Kraft, Gödel, Neurath, ed. Josef Speck, Vandenhoeck & Ruprecht: Göttingen, 1992 (= *Uni-Taschenbücher*; 1654), ISBN 3-525-03319-2, 224 pp.

Reviewed by

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The book under review is the latest volume of a series entitled *Grundprobleme der großen Philosophen*, created and edited by Josef Speck. The thirteen volumes that have been published concern *Philosophie des Altertums und des Mittelalters* (1 vol.), *Philosophie der Neuzeit* (6 vols.) and *Philosophie der Gegenwart* (6 vols.). It seems to be rather difficult, however, to find a reasonable criterion for the series' distinction between modern time ("Neuzeit") and present time ("Gegenwart"). For example, the new volume is devoted to Alfred Tarski, Hans Reichenbach, Victor Kraft, Kurt Gödel and Otto Neurath, and it covers the philosophy of modern time. The first volume on the philosophy of present time (3rd ed., 1985) treats Gottlob Frege, Rudolf Carnap, Ludwig Wittgenstein, Karl Popper, Bertrand Russell and Alfred North Whitehead, i.e., contemporaries of the aforementioned philosophers.

In the volumes of the series it is Josef Speck's intention to include articles on thinkers "who had a decisive influence on the development of occidental intellectual history or who were important for contemporary philosophy" (5). Speck does not aim at complete and comprehensive presentations of the particular philosophical systems. The contributions center around the basic problems identified by each philosopher, or, if such problems cannot be isolated, around to the complex of problems fundamental for the particular philosophical conceptions or, at least, suitable for paving the way to their understanding. The selection of such basic problems, and the emphases of presentation are due to the

authors. Thus, uniformity cannot be expected, but differences in style and presentation can be specially attractive.

The present volume comprises contributions on philosophers who worked in logic and the philosophy of science, and belonged to Neopositivism or at least stood close to it. A further bond between the contributions is the central position of the truth problem. It is explicitly the topic of the first paper on "Alfred Tarski. Die semantische Konzeption der Wahrheit" (9–66) by Alfred Kamitz (Graz). As a member of the Lwow-Warsaw school Tarski (1901–1983) was regarded as a representative of the "scientific world view" propagated by the Logical Empiricists of the Vienna Circle. Andreas Kamlah (Osnabrück) discusses "Hans Reichenbach: Prinzipien, Konventionen, Wahrscheinlichkeit" (67–109).

Reichenbach (1891–1953) was the leader of the Society for Scientific Philosophy in Berlin, the German counterpart of the Vienna Circle. Alfred Schramm (Graz) writes on "Viktor Kraft: Konstruktiver Realismus" (110–137). Kraft (1880–1975) was a member of the Vienna Circle, although being far from the "radical positions" of some of its members. Christian Thiel (Erlangen) investigates "Kurt Gödel: Die Grenzen der Kalküle" (138–181). Gödel (1906–1976) was introduced to the circle around Moritz Schlick by Hans Hahn in 1926. The volume is completed by a contribution by Frank Hofmann-Grüneberg (Rutesheim) on "Otto Neurath: Sprache und Wahrheit in der Einheitswissenschaft." Neurath (1882–1945) was the dogmatic spokesman of the Vienna Circle. The contributions present biographical information on the discussed philosophers and bibliographical hints of varying extension. The contributions on Tarski and Gödel being closer to the scope of this journal, will be discussed in greater detail.

In the first section of his paper Kamitz gives the context of Tarski's contributions to logic and the semantic theory of truth especially by sketching its relation to the philosophy of the Lwow-Warsaw school. He then connects them to Tarski's metamathematics, defined as a discipline for the syntactical and semantical analysis of deductive systems (13). In the third section Kamitz develops Tarski's semantical definition of truth step by step. He gives the foundations of this definition by identifying Tarski's approach as correspondence-theoretical, discussing propositions as carriers of truth, developing Tarski's conception of language hierarchies and his use of the term "formalized language", and finally distinguishing between terms, names of terms, object- and metalanguage. Kamitz exposes Tarski's truth explication as a methodological tool (26f.). He presents the conditions for a "satisfactory explication" of

"true proposition in L" which is added as an additional axiom to the meta-language K of L (30–33). According to Tarski, satisfactory explications have to be sufficiently exact, formally correct, and appropriate to the matter. Kamitz treats extensively Tarski's discussion of the Liar paradox (33–39), and gives a satisfactory explication of "true proposition in the language of the class calculus" (39–58). He ends with a discussion of truth definitions in language hierarchies (58–64).

Kamitz's contribution can hardly be regarded as an introduction to Tarski's theory of truth, its formal requirements being too extensive. Even if the reader has elementary knowledge in logic on the level of "at least" Tarski's *Introduction to Mathematical Logic*, as Kamitz demands for an efficient lecture, he is not dispensed from working through it intensively. Some typesetting errors especially in formulas can be found, some fonts are inappropriate (e.g., strange blackboard characters, compound "Ł" in "Łukasiewicz", missing accent in "Leśniewski").

Thiel discusses Kurt Gödel's famous metamathematical results of 1930/31. The subtitle "The Limits of Calculi" ("Die Grenzen der Kalküle") programmatically outlines Thiel's own assessment of their historical value. Thiel starts with a representative selection of Gödel's results viewed within the context of the then contemporary discussion on the philosophy of mathematics. He treats especially the completeness proof for first order predicate logic, Gödel's work on the relation between classical and effective propositional logic, on the "translation" of propositional functions of classical logic into those of effective logic and vice versa, his philosophy of mathematical realism, his contributions to the decision problem and to the generalized continuum hypothesis (139–147). After this Thiel turns to Gödel's incompleteness theorems which he connects to Hilbert's demand for a consistency proof for arithmetic presented to the First International Congress of Mathematicians in Paris in 1900. Hilbert's metamathematical programme, his finitism (following Jacques Herbrand), and his concept of a "strict formalization" ("Vollformalismus") are sketched (148–182). In the fourth section (152–157) Thiel follows the structure of Gödel's original paper of 1931 "Über formal unentscheidbare Sätze der Principia Mathematica und verwandte Systeme I" up to the result that the consistency of a strict formalization P cannot be proved in P. In the fifth section Thiel describes Gödel's method of arithmetization ("Gödelisierung") used to create a strict formalization (158–161), and he discusses the effective computability of functions and the property of recursivity which was systematically introduced by Gödel. Thiel treats the representation of recursive predicates by propositional functions of the strict formalization P,

used in the first theorem of non-deducability (163–167). In the eighth section Thiel shows that Gödel's second theorem of non-deducability, claiming that in a consistent strict formalization P, the proposition W representing in P the consistency of P cannot be deduced, means the end of the strict version of Hilbert's programme. It can be saved in mathematical practice by suitable interpretations of the term "finite" by using, e.g., suitable ω–rules, or following Paul Lorenzen's constructivism. In the last section Thiel reflects on the consequences of Gödel's results. Even though they brought an end to universal programmes for "mastering the stock of knowledge of mankind" (175) from Leibniz to Hilbert, they should not be overestimated. Thiel doubts the universality of the notion of a calculus, because already the answer to the question whether man's brain works even in mathematical reasoning according to a calculus is still controversial. Gödel has, however, shown the principal limits of calculi, and has thus brought constructive mathematics into view as a liberating domain of creativity, and this, Thiel writes, is the "positive effect of Gödel's contribution for mathematics and its philosophy" (179).

The other contributions concern mainly the philosophy of science. Andreas Kamlah discusses the question"To what extent scientific knowledge contains a priori principles, to what extent conventions, and what is the portion of experience?" (68). Schramm exposes Victor Kraft's "constructive realism", the methodological direction of Kraft's 70 years of philosophical work. Finally, Hofmann-Grüneberg presents Otto Neurath's unity of science conception as onnected to a radically empiristic theory of truth.

The volume comprises five contributions, two of which are relevant for the history of logic. In their differences they give a vivid impression of the diversity of the so-called "scientific philosophy" of the first half of this century which is usually seen as a monolithic block.